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ON AN EFFICIENT DRUG PRESS.

By Chas. T. George, Harrisburg.

Read at the meeting of the Penn'a Pharmaceutical Association, Reading, June 11.

The drug press is an important piece of machinery for every well-regulated drug store, and should combine the following qualifications in order to make it a success.

First. Great power, easily applied.

Second. Cleanliness during operation, and easily cleaned after being used.

Third. It should be applicable for all manner of pressing: oils, alcoholic and water preparations, as well as fruit juices.

Fourth. Simplicity of structure, in order to insure cheapness of repair in case of breakage.

The most powerful press that suggests itself to our consideration is the hydraulic or Bramah press; this, however, has many qualities calculated to interfere with its usefulness in a retail drug store. 1st. Its complicated machinery and expense. 2d. On account of the liquids used in the production of power; if water is used, it is apt to freeze in winter, and thus disable the press; should oil or glycerin be used instead of water, it will add materially to the cost as well as increase its filthiness.

The next press that presents itself for inspection is the single screw press, where the screw descends perpendicularly upon a horizontal block, moving within a perforated vessel; this surrounded by a vessel not perforated, but having a spout or outlet for the expressed liquid at the bottom. This press is much in use, and deservedly so, on account of simplicity of structure and cheapness; and where great power is not required, as in the simple expression of tinctures, it is all that could be desired. The objections are: 1st. That great power cannot be

applied to a single-screw press without making the horizontal block raise or cant along the side, thus making the pressure uneven and partial or filling the perforations and preventing the flow of the expressed liquids; neither can it be used for expressing oil or fatty substances, on account of the difficulty of applying heat. It is also troublesome to clean, as every part of the press must necessarily be soiled by the drug or liquid.

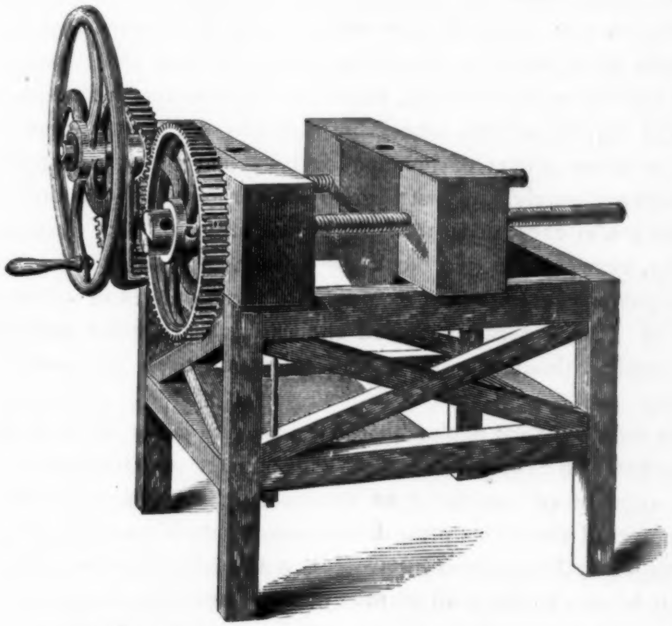
The press known as Friedrich Mohr's horizontal double screw press seems, to my mind, better adapted to the wants of pharmacy than those previously described, 1st, because canting or uneven pressure is impossible, the sack containing the drug being placed between the two screws; 2d, because it is easy of access, being open on all sides; 3d, because it is useful for expressing everything but oils; 4th, because it is easily cleaned, easily repaired, and cheap. However, it is not unobjectionable, 1st, because great power cannot be attained with the short lever handles attached to the nuts, which alone are movable, the screws being stationary in the movable horizontal block; 2d, because there is always great danger of bending or breaking the screws because only one screw can be turned at a time, and by carelessly drawing one tighter than the other injury must result to the press; 3d, because the press, if carefully operated, is very slow and tedious in its results; 4th, because it is not adapted to the expression of oils unless by the use of metallic saddle-plates, which could be heated and hung upon the horizontal blocks, the drug for expression resting between the heated saddle shaped plates. This, however, would only insure partial success, as the heat must always be very irregular in temperature and, of course, rapidly dissipated, when it would be necessary to remove the cold plates and replace them with heated ones, occasioning much labor, with trifling results.

Having often experienced the wants of a good substantial drug press, and being unable to purchase one that approached my idea of a perfect druggists' press, I had one made, which has proved satisfactory in every way, and which I will now try to describe.

The first part consists of a strong and substantial framework, made of ashwood, 2½ inches square, 32 inches long, 26 inches wide and 25 inches high, forming the base or table, upon which the press moves.

The second part consists of two pieces of timber, resting upon this frame, each of which is 28 inches in length, 9 inches high and 6 inches

wide, one firmly attached by iron rod and keepers to one end of the frame or table, and the other one free or movable, both blocks at same distance from end being bored with smooth holes to receive the two iron screws.



Upon the movable block, and opposite the holes, a female nut of bell-metal is firmly fixed. Upon the inner face of these two timber blocks an iron casting, saddle-shaped and hollow, is inserted, flush or even with the face of the block, the height and width of which is 12 inches and the diameter 3 inches; the thickness of the iron crust being $\frac{3}{4}$ inch, leaves a cavity of $1\frac{1}{2}$ inch in diameter, or capable of holding 6 pints of boiling water each, each casting having a hole on top to receive

hot water or steam, and to discharge the chilled water at bottom a brass pet-cock is fixed.

The two iron screws are 32 inches long and 2 inches in diameter, and of course pass through the holes of both blocks of timber; the head of each screw has an iron cog-wheel, 16 inches in diameter, attached; into the cogs of both wheels a 4-inch pinion-wheel is neatly and firmly fixed, which in turn is fastened to a short shaft having at its end an iron fly or lever-wheel, 22 inches in diameter, with handle.

By the turning of this wheel both screws are evenly and rapidly turned, without danger of bending or breaking, and consequently one block drawn surely and with great power against the other, thus expressing whatever drug may be placed, in a sack of strong linen toweling, between the two blocks of timber.

The power is great enough to express three ounces of oil from one pound of linseed meal, provided the castings are filled with boiling water, and without any great muscular effort on the part of the operator.

Two saddle-shaped poplar boards are used to cover the iron castings when wanted to express other than oily or fatty preparations.

On account of simplicity of structure, cheapness, cleanliness and great power, I think this press will commend itself to every druggist in the land who takes pride in his profession and labors for the public good. With it he can produce all manner of expressed oils, oils and ointments by decoction economically expressed, tinctures, fluid extracts and fruit juices.

In conclusion, I wish to state that a sketch of the press accompanies the description; and, furthermore, that no patent has been applied for, and that any one is at liberty to make use of my very limited experience in press building and the use of the press in pharmacy.

THE MICROSCOPE.

By Hans M. Wilder.

Considering the growing importance of the microscope for the pharmacist (an importance which dates not from yesterday), it is a curious fact that in all the forty-nine volumes of the "American Journal of Pharmacy" no mention has been made of the desirability, if not for every pharmacist, at least for every apothecary, of possessing such an instrument. Only a passing notice is found in vol. xxv (1853), p. 45.

Although only a mere beginner in microscopy, I take the liberty of calling the attention of my colleagues to this instrument, and of suggesting that some instruction in the use of it be provided by the different pharmaceutical colleges, in conformity with the usages of most medical colleges; attention to said instruction of course not being obligatory at first.

Two ideas seem to have deterred most pharmacists from buying a microscope: That it is difficult to use, and that it is very expensive.

1. The mere handling of the microscope (which is little more than taking proper care of the instrument and of one's eyes) is learned easily enough; the intelligent use of the different parts and accessories is only learned by practice; under guidance, if attainable. There is, however, this advantage with the microscope: it is never tedious, always interesting, and with increasing familiarity with its use grows more so. Before one has had it two weeks its usefulness will be felt.

2. As to its expensiveness—well, yes, that is true—neither five, nor ten, nor fifteen dollars will buy an instrument worthy of the name. A serviceable *working* microscope can not be had for less than thirty-five or forty dollars, including the most necessary accessories; as necessity demands and circumstances permit, additional apparatus may be fitted at any time and without trouble.

Illustrated catalogues may be obtained from most opticians for a return stamp, and will convey better information as to price, etc., than can conveniently be given here. The first-class microscopes cost from $1,400 down to $2—300, and contain more apparatus than the average pharmacist is likely to use or even to understand, hence they are out of the question. The second-class (student's, professional, physician's), $60—100 or more, will satisfy the most exacting of our profession. The third-class (educational, economical), $35—50, will perhaps suit the purposes of most pharmacists.

The binocular microscope is of such general usefulness that it should be preferred where its price is not a positive objection (not under $100). Foreign microscopes are, as a rule, cheaper, but with an import duty of 40 per cent. and other expenses they will cost as much, if not more, than American instruments.

I would strongly recommend to get "Phin, practical hints on the use of the microscope." This little book restricts itself to its subject and

contains all the advice that can be given on paper, being one of the best substitutes for personal (oral) instruction.

Being, as before stated, only a beginner, it would be ridiculous to recommend a particular make; but thas is not necessary; for the purposes of the pharmacist the microscope of any *respectable* optician is the best. The differences between the various makes are only perceptible when employing high amplifications, say 800 to 1,000 and more diameters. I only take the liberty to remark that we here in Philadelphia have Zentmayer, 147 South Fourth street; Queen, 924 Chestnut street, and the branch of R. & J. Beck (London), 921 Chestnut street—of course nearly every seller of optical instruments keeps microscopes.

Those wishing for further guidance are referred to the synopsis of American microscopes, by R. H. Ward, in the "American Naturalist," vol. vi, 1872, p. 323 and 326.

The time is not far distant when a microscope will belong as much to the *necessary* outfit of a well-appointed drug store as a pair of Troemner's or Becker's prescription scales.

INFUSUM DIGITALIS.

By Delbert E. Prall, Ph.G.

From an Inaugural Essay.

As this officinal infusion contains two fluidounces of tincture of cinnamon to the pint it will keep for a considerable length of time without decomposing, the tincture of cinnamon containing sufficient alcohol to preserve it. It is, therefore, sometimes kept on hand ready to dispense. But soon after it is made it becomes turbid, and an unsightly precipitate is formed which usually settles at the bottom of the bottle, and the question arises: Would it be proper to filter and dispense it clear, or does the precipitate contain some of the active principles of the digitalis? To ascertain whether the precipitate contains digitalin the following experiments were made: From German digitalis leaves 138 fluidounces of infusion were made by the Pharmacopœia process. In a few hours it became turbid. It was allowed to stand two months; at the end of this time some of the precipitate had settled to the bottom of the bottle and a part remained suspended in the liquid. I then began to filter it through paper pulp. It came through clear, but

after a portion had stood a few days a precipitate was again formed. This portion was returned to the filter and, as in each successive portion a precipitate was formed after standing, the filtration was continued until the whole quantity had passed through the pulp four or five times, the process of filtration occupying six weeks.

As it seemed disposed to precipitate for an indefinite length of time, I commenced operating on the precipitate I had obtained, which I estimated to be not more than two drachms. First washed the pulp with which it was mixed with distilled water, then dried the whole on a water-bath, introduced it into a percolator and moistened with menstruum of three parts of stronger alcohol and one part of distilled water; as soon as dropping commenced, corked and set aside in a moderately warm place for four days; then removed the cork and continued the percolation, adding, when the liquid had disappeared from the surface, two fluidounces of the same menstruum and afterwards diluted alcohol, until five and one-third fluidounces of percolate were obtained; evaporated the percolate to one fluidounce, added 10 minims acetic acid and 8 grains animal charcoal; set aside for 24 hours, filtered, obtaining a clear solution; almost neutralized with aqua ammoniæ, then gradually added 25 grains of tannic acid dissolved in one fluidounce of distilled water. The mixture remained clear. From this I inferred the absence of digitalin.

Inferring from my observations that the precipitate in infusion of digitalis is caused by the cinnamon, I made a quart of infusion omitting the tincture of cinnamon and using instead the required quantity of alcohol and water in the proportions used in making tincture of cinnamon. The result was a preparation that remained clear for a much longer time than the officinal infusion.

As an additional proof that the precipitate is caused by cinnamon may be cited the precipitate that is formed in each of the liquid preparations of the U. S. Pharmacopœia containing cinnamon. To prove that these precipitates are caused by cinnamon the following experiments were made:

Cinnamon was exhausted by alcohol in the same proportion as directed for elixir of vitriol, and then mixed with the requisite quantity of sulphuric acid. This mixture remained clear only a few minutes, then a copious precipitate was formed. Ginger, treated in precisely the same manner, gave a liquid which was permanently clear, and when

mixed with the cinnamon preparation the result was, apparently, the officinal elixir of vitriol.

For an aqueous preparation the compound infusion of catechu was selected. A portion was made according to the officinal process and another portion omitting the cinnamon. In the officinal a precipitate settled to the bottom in a few hours, in the portion from which the cinnamon was omitted no such precipitate was formed.

Though the tests to which the precipitate in the officinal infusion of digitalis was subjected would seem to indicate that it contains no digitalin, and that it would, therefore, be proper to pour off and dispense the supernatant liquid, yet this does not afford a satisfactory preparation, it being turbid, unpalatable and, if recently made, liable to further precipitation. In the hope of discovering a formula that would prove a desirable substitute for the present officinal process, I made the following experiments, using the English leaves, which I found to yield a precipitate similar to that from the German leaves: To one-half pint of the aqueous infusion I added an elixir of licorice made according to Kennedy's formula ("Am. Jour. Pharm.," 1876, p. 231), but before enough had been added to mask the bitter taste, a precipitate was formed. To another portion of the infusion spirit of cinnamon was added, but with the same result. I then tried exhausting one drachm of digitalis with three fluidounces of boiling water, adding, when cold, five fluidounces of distilled cinnamon water, and filtering. And the same process was followed using cinnamon water made from the oil. These two preparations were unexceptionable in appearance, but the bitter taste of the digitalis was not disguised.

I next used glycerin, adding it to the officinal infusion. I ascertained that to prevent precipitation there must be added to one-half pint of infusion at least two fluidounces of glycerin, which should first be mixed with the fluidounce of tincture of cinnamon and then added to the aqueous portion. This affords the most palatable preparation of any that I have tried, and has stood for several weeks without any signs of precipitation; but the quantity of glycerin required is objectionably large.

From the foregoing it will be seen that I have not succeeded in discovering an unobjectionable adjuvant for the infusion which will disguise the taste of digitalis without producing a precipitate. Generally, in pharmaceutical preparations, it is desirable to avoid occasioning a

precipitate, and especially is it desirable to avoid dispensing a preparation which when it leaves the dispensing counter is clear and yet in an hour or two throws down a copious precipitate. Such a change is apt to cause a suspicion in the mind of the patient and to embarrass or prevent the usefulness of the medicine. The present Pharmacopœia process for infusion of digitalis is objectionable, because it not only causes a copious precipitation within a short time after the infusion is made, but the cause of the precipitate—the tincture of cinnamon—is almost a useless addition, as it does not materially improve the taste of the preparation. The writer therefore suggests that it would be desirable to have the present Pharmacopœia process replaced by one which would direct simply the aqueous infusion filtered through paper, and omitting the tincture of cinnamon. Such a preparation has an excellent appearance; it could be prescribed with directions to follow each dose with syrup or other adjuvant which would modify the bitter taste, and it remains clear long enough to allow the patient to take, in ordinary doses at proper intervals, as much as is usually ordered in a prescription.

TOBACCO STATISTICS.

Tobacco was unknown to Europeans until after the discovery of America by Columbus. Samples of it were taken to England, and the use was there made fashionable by Sir Walter Raleigh and others, who had acquired a taste for it in Virginia, where it held an important place in all Indian ceremonies.

The United States is the greatest tobacco-producing region of the world, and yet, with its hundreds of millions of pounds produced, and its millions of revenue, the area planted is most insignificant. The statistics for 1875 give but 559,049 acres of land in all the States and Territories planted in tobacco, or about forty townships, making two ordinary-sized counties, as the gross area of this country supplying the world with the weed.

As a producer Kentucky takes precedence, as will be seen from the following statement:

Kentucky, 1875,	130,000,000 lbs.	North Carolina, 1875,	14,750,000 lbs.
Virginia, 1875,	57,000,000	Ohio, 1875,	13,500,000
Missouri, 1875,	40,000,000	Indiana, 1875,	12,750,000
Tennessee, 1875,	35,000,000	Connecticut, 1875,	9,900,000
Maryland, 1875,	22,000,000	Massachusetts, 1875,	8,500,000
Pennsylvania, 1875,	16,000,000	Illinois, 1875,	8,000,000
Pennsylvania, 1876,	35,000,000[1]		

[1] 30,000,000 lbs. were raised in Lancaster county alone.

The above are the figures for the census of 1875.

Soil.—The soil required should be deep, of a sandy or loamy nature; rich, mellow and warm virgin soil is better than old land. It should be of a rolling nature and with an eastern or southern exposure if upon a hill; lowlands, river bottom lands do well if not subject to overflow. Of all the districts now engaged in cultivating this plant Connecticut and Pennsylvania present the highest average yield, 1,600 lbs. per acre, as taken from the report of the Commissioner of Agriculture for the United States.

Kentucky	averages	630 lbs.	per acre.	N. Hampsh'e	averages	1600 lbs.	per acre.
Virginia	"	630	"	New York	"	800	"
Missouri	"	850	"	Massachusetts	"	1350	"
Maryland	"	675	"	Georgia	"	550	"
West Virginia	"	680	"	Florida	"	750	"
N. Carolina	"	500	"	Mississippi	"	317	"
Tennessee	"	675	"	Alabama	"	465	"
Ohio	"	700	"	Arkansas	"	822	"
Indiana	"	500	"	Wisconsin	"	500	"
Illinois	"	550	"	Kansas	"	670	"
Texas,	"	650	"				

This report is for 1875.

The large average yield in Pennsylvania now exceeds that of any other State. This result is mainly due to the excellence of her soil and farming combined. H. N. R.

TOBACCO CULTIVATION IN VIRGINIA.

By David Patrick Miller, Ph.G.

From an Inaugural Essay.

The cultivation of the tobacco plant constitutes one of the most important branches of agricultural pursuit in the State of Virginia, it being in some sections the chief product of the soil. The extent of its cultivation is shown by the fact that the total yield of the tobacco crop for the year 1875 in Virginia was 65,000 hogsheads, which, valued at $120 per hhd.—about the average value—makes the total value of the crop $7,800,000, or obout one-fourth of the value of that of the whole United States for that year.

Tobacco is one of the most exhaustive of crops, requiring a dark, rich soil, which must be renewed annually with manures and other

fertilizers; moreover, it requires strict care and close attention during the whole period of its growth. Yet the high price generally paid for good tobacco, which has been well cured, fully repays the planter for his time and trouble expended. The kind most generally cultivated in Virginia is the "common" tobacco (as it is called), the Nicotiana tabacum of our Pharmacopœia, a tall, stately plant, sometimes attaining the height of five or even six feet and having large, broad leaves, some of which attain a length of two feet. The first step in the cultivation of tobacco is sowing the seed in a "plant bed," which is accomplished in the following manner: A warm, dry spot with a southern exposure being selected, it is prepared for the reception of the seed by having the ground cleared and all the sticks, brushwood, etc., upon it burned and the ashes raked over the surface; this process effectually rids the ground of the seed of weeds. The seeds are so minute that they require to be mixed with sand and scattered broadcast, and even then, as is the case with many other small seeds, many do not germinate from being sown too deep. After the seeds are sown the "bed" is surrounded by a temporary fence, to protect it from the depredations of cattle, and the young plants, when they appear, are watched carefully, being watered regularly and liquid manures sometimes applied to them to hasten the growth; they must also be protected during chilly nights by having cloths spread over the "bed." Sometimes the "bed" is attacked by flies, which play sad havoc among the plants, and necessitate a replanting.

When the plants have attained a height of six to eight inches, they are ready to be transplanted, which is best done just after a rain. The ground, having been previously prepared for the reception of the plants by manures or fertilizers, is divided off into rows running about three feet apart one way and four the other; at the squares formed by the intersections of these rows hills of earth are heaped up, in which the plants are set out.

The planting is done in this manner: Some of the men take a number of the plants in baskets, and each one selecting a row of hills, traverses the entire distance of the field, dropping a plant upon each hill; each one of these is followed by a second person, who takes up the plant, and making a hole in the top of the hill with a stick which he carries in his hand, inserts the plant in it and levels the earth around it.

When the transplanting is finished, the plants do not generally require

any attention for a while; pretty soon, however, in some cases, they are attacked by worms, chief among which is a large green worm, which, if let alone, would soon destroy the entire crop. This worm, the same which infests tomato plants but which is commonly called the "tobacco worm," is generally found on the under surface of the leaves, and, being of the same color, is not quickly detected by inexperienced persons. It is very voracious, feeding upon the green leaves and attaining sometimes the size of the little finger and a length of two to three inches.

Each plant must be examined closely for several days, in order to be rid effectually of these worms, the process of removing which is termed "worming." Sometimes they appear in such numbers that the whole "force" has to be put to work to kill them, or the result would be very disastrous to the crop. After the plants have been pretty effectually rid of these pests, the next step in the cultivation is "priming," as it is termed. This consists in breaking off such of the lower leaves as are either small or touch the ground. Some planters, considering these of no value, do not care to save them; others, on the other hand, prefer to cure them with the rest of the leaves, afterwards separating and sending them to market by themselves, where they are classified as "primings." Of course they bring a low price in comparison with the rest of the leaves, but generally enough to repay for the trouble of curing them.

The plants, which by this time have acquired considerable size, and are ready to flower, now require "topping." This consists in breaking off the tops, thereby causing all the nourishment, which would otherwise be expended upon the flowers, to be diverted to the leaves, resulting in their more rapid development. Soon after this operation is finished, buds appear in the axils of the leaves, which are termed "suckers," and the operation of removing which is called "suckering." This is a laborious occupation, as it must necessarily be kept up as long as the buds appear, since they would detract materially from the growth of the leaves.

After this the plants do not require much attention, being left alone until the leaves are ripe and ready to be cut, which is generally done in the latter part of September or first of October, if they have had a suitable season. Great care must be exercised in judging of the ripeness of the crop, as over-ripeness is to be guarded against as well as, if

not more, than its opposite. Experienced persons generally judge by the color and feel of the leaf. For cutting, a sharp knife, resembling that of a shoemaker, is used, and the plants are cut close to the ground, being severed with one blow. After being cut the plants are not gathered immediately, but are allowed to remain on the ground long enough to wilt but not to be burnt by the sun. The main stocks of the plants are now split about half way up, and the plants are then placed astraddle "tobacco sticks," which are five or six feet long and have been prepared for the purpose, and are thus carried, for the purpose of drying, to the "tobacco house," a building erected expressly for the purpose. This house is built of logs, generally with sufficient space between them to admit of a circulation of air; it has, besides, ventilators in the roof and rows of large poles, placed five or six feet apart, reaching from one side of the house to the other, the rows extending from the roof to within a few feet of the floor, resembling somewhat the rafters for the floors of a dwelling-house. The sticks containing the plants are placed across the poles, one row being filled up and then another, and so on until the building is full. A fire is now kindled in the middle of the floor and kept up without intermission for four or five weeks, at the end of which time the tobacco is generally sufficiently dried. During all this time it must be watched closely, the door being closed and a free circulation of air allowed through the ventilators; sometimes, however, a shorter time is required for drying. When the tobacco is dried, a damp day being selected, it is taken down preparatory to stripping. The leaves are all stripped from the plants and thrown into a heap by one man; another then assorts them, placing the most inferior in one parcel by themselves, the next in quality likewise together, and so on through the entire pile. Each parcel is done up separately into "hands," as they are called. This consists in gathering up the leaves, spreading them out, placing them one upon the other, and, when five or six ouces in weight have thus been obtained, tying the parcel around at the end with another leaf, which has been twisted to form a string. Having been all made up into "hands," the tobacco is packed preparatory for shipment to market; sometimes, however, when the market is not far distant, it is not packed, but simply transported loosely in wagons, and then constitutes "loose tobacco." It is packed sometimes in large boxes, but generally in large hogsheads. The packing is done in the following manner: A person gets into the

box or hogshead and, the tobacco being handed to him, he places it carefully in the bottom of the vessel, and then another layer upon this until it reaches a height of twelve or eighteen inches; he then gets out, and powerful pressure is applied by means of large screws and blocks to force the leaves into a small space; another layer is then put in, this is also compressed, and so on until the box or hogshead is filled and ready for shipment.

So far the tobacco is simply the dried leaves of the plant, and possesses none of the aroma for which it is so highly prized by those addicted to the use of it. This is acquired only after the tobacco has undergone a process called "bulking." This operation is conducted sometimes by the planters, but generally by the merchants who purchase it. It is done in the following manner: The tobacco is collected together into a compact circular heap, the butts of the hands being placed together in the centre, and the whole then covered with heavy blankets or other woolen cloths; it is allowed to remain in this condition until it undergoes a sweating process, during which the peculiar odor or aroma is developed.

This may be due to the liberation of some principle which was present before, or to some chemical change taking place between pre-existing principles; however, this is not known to be a fact, but is only a conjecture. The matter has never been fully made out; certain it is, though, that after the "curing" the leaves possess an entirely different odor from that which they had in the fresh state. After the operation of "bulking" is finished the tobacco is ready for the manufacturer's hands, to be made into smoking or chewing tobacco or snuff.

A FALSE PAREIRA BRAVA.

By Charles Morrison, Ph.G.

From an Inaugural Essay.

The drug examined was of Brazilian origin, and sent to this country as true "pareira brava, obtained from Cissampelos pareira;" but it corresponded neither to the description of Cissampelos nor of Chondodendron. It consisted of the woody stems of a menispermaceous plant, was covered with a gray bark, and the bright-yellow wood was formed of more or less eccentric layers of fibro-vascular tissue.

The drug was reduced to fine powder, 12·0 grams of it, exposed to

a temperature of 200°F., lost 1·21 gram, equal to 10·1 per cent. Ten grams, dried as above, moistened with alcohol and packed firmly in a conical percolator, required 15½ ounces of alcohol to exhaust it. On again carefully drying, it was found to weigh 9·025 grams, showing the alcohol had taken up ·975 gram. The percolate was evaporated to 2 fluidounces, and 25 drops of sulphuric acid added; on standing 2 days it threw down a precipitate of a dark yellow color, weighing ·3665 grm. The balance of the drug was then exhausted with alcohol in the same manner, and the percolate reduced by evaporation to 3 fluidounces, to which, while hot, 40 drops of sulphuric acid were added. After two days a large quantity of dark-colored crystals, having a smell very similar to honey, was obtained. The mother-liquor was drained off and the precipitate washed with water acidulated with sulphuric acid, 20 drops to the ounce, until the coloring matter was all removed. The residue was dissolved in hot alcohol, from which it was thrown down, on cooling, in beautiful yellow stellate crystals, which were further purified with the aid of animal charcoal and by recrystallization from alcohol. The crystals resembled those of berberina salt in appearance, and to prove their identity the same tests were applied to both, when it was found that muriate of berberina readily volatilized, while the other product was carbonized and required the addition of nitric acid to make it volatilize readily. The berberina salt does not form a clear solution with ether, but the salt obtained was readily soluble, forming a bright-yellow solution. The berberina salt is less soluble in cold water and almost insoluble in ammonia water, while the other is readily soluble. Treating boiling aqueous solution of each with a solution of bichromate of potassium, the product of the false pareira did not show any signs of precipitation until it had stood ten to fifteen minutes after becoming cool, while berberina formed a precipitate before it had become cool, the precipitates in both cases being fine needle-like crystals. On adding a drop of muriatic acid to each of the above precipitates, diffused in water and heating, the solution remained clear after cooling, while berberina threw down a bulky precipitate.

Treating cold aqueous solutions of each with a solution of nitrate of silver in hyposulphite of sodium, the pareira alkaloid was not precipitated, nor was the clear solution changed by heating, while berberina threw down fine, light-colored, needle-like crystals, the clear solution also being unaffected by heat. To a hot alcoholic solution of each a

solution of iodine in iodide of potassium was carefully added; berberina threw down a precipitate of beautiful green spangles, while the other deposited a reddish-brown crystalline precipitate. The dark-brown substance having a sweet, honey-like odor, above referred to, was readily soluble in ether and in hot and cold alcohol; insoluble in petroleum benzin; soluble in caustic potassa, which solution was not precipitated by muriatic or sulphuric acid. The etherial solution, on evaporation, yielded a powder of a brown color.

The filtrate from the first precipitate obtained with sulphuric acid gave a precipitate with ammonia water which was not re-dissolved on adding an excess. The sulphuric acid was removed with carbonate of barium; the liquid acidulated with hydrochloric acid and treated with Mayer's test gave a heavy precipitate of a light-yellow color. The filtrate rendered alkaline by ammonia, and agitated with ether, it was found not to take up anything. On treating the precipitate by Mayer's test with an excess of carbonate of potassa, it was turned of a dark dull-red hue, and gave, with a mixture of one part of ether and two of alcohol, a light-yellow solution, from which a slight reaction with Mayer's test was obtained; with solution of iodine in iodide of potassium light-yellow crystals were formed.

It appears from the above that this false pareira brava contains two alkaloids, both of a yellow color, one of which is similar to berberina, but differs from it in several important reactions.

LIQUOR POTASSÆ.

By Ed. Rosenthal, Ph.G.

From an Inaugural Essay.

Of the many chemical preparations of the Pharmacopœia, there is none, perhaps, the working formula of which is more simple than that of the subject of this paper; and it might be supposed that in consequence thereof the product should be at once pure and of a standard strength. With a view to ascertain if such is really the case, and to find out what the impurities are, if any, also how near the average article, produced according to the officinal formula, approached to the standard of the requirements of the Pharmacopœia, I have investigated the subject as follows below. The cheapness of the material used in the preparation leaves no reason to suppose that any impurities therein could exist

by adulteration; still, through carelessness or neglect of the operator, potassium carbonate, silica, alumina and lime salts are sometimes found to such an extent that they will impede the application for therapeutical but more especially for chemical purposes.

Of seventeen samples of liquor potassæ, purchased from a corresponding number of reputable pharmacists, which I have examined, I find that a deficiency of strength was the principal defect. They are found to range in specific gravity from 1·036 (one) to 1·065 (one) and to require for 48·02 grams from 38 to 50 cubic centimeters of volumetric solution of oxalic acid.

Made by the first process of the Pharmacopœia, viz, boiling bicarbonate of potassium with lime, the solution was in most cases obtained of the specific gravity 1·047; and when made by dissolving a troyounce of potassa in a pint of distilled water, it had the density of 1·053.

Hence either the specific gravity as required or the formula is incorrect. But taking for granted that the specific gravity is considered the standard for liquid preparations, I have, after many experiments, ascertained the formulas by which the quantity directed to be made (seven pints) coincides with the specific gravity 1·065, which I submit below:

Take of	Bicarbonate of potassium,	17 troyounces	and 160 grains.
	Lime, . . .	11 "	" 160 "
	Distilled water, a sufficient quantity.		

Dissolve the bicarbonate of potassium in 4 pints of distilled water and heat the solution until effervescence ceases; then add distilled water to make up the loss by evaporation, and heat the solution to the boiling point. Mix the lime with 4 pints of distilled water, and, having heated the mixture to the boiling point, add it to the alkaline solution and boil for ten minutes. Then transfer the whole to a muslin strainer, and, when the liquid portion has passed, add enough distilled water through the strainer to make the strained liquid measure 7 pints. Lastly, keep the liquid in well-stopped bottles of green glass. Solution of potassa thus prepared has the specific gravity 1·065, and contains six and six-tenths per cent. of hydrate of potassium.

Solution of potassa may also be prepared in the following manner:

Take of	Potassa, . . .	640 grains.
	Distilled water, .	one pint.

Dissolve the potassa in the distilled water, and allow the solution to stand until the sediment subsides; then pour off the clear liquid and keep it in a well-stopped bottle of green glass. The specific gravity of the preparation of this formula is 1·065, and 48·02 grams of it will take 50 cc. of volumetric solution of oxalic acid for complete neutralization.

LABORATORY NOTES ON FLUID EXTRACT OF CIMICIFUGA.

BY J. U. LLOYD, Cincinnati, O.

(Continued from page 15.)

The formula of the Pharmacopœia, carefully followed, did not yield a fluid extract representing the powdered cimicifuga. The formula suggested for solid extracts, on page 1164, U. S. D., was inferior. The operation of repercolation slightly excelled the officinal, but was surpassed by simple percolation without maceration, which excelled all. The experiments offered show that height of powder exerts a direct influence upon the extractive power of the menstruum, up to fifteen inches (beyond this none were offered), increasing the amount of material dissolved, as the perpendicular height of the powder increased.

Theory indicates that this must be a natural law, and the writer believes that a comparison of processes, if just, must establish this point.

Thirty-four experiments, heretofore introduced, were for the purpose of comparing the several processes of percolation under the circumstances given; and under like conditions only can just comparisons be made.

I now continue the subject and give two tables, in which critical comparisons are made of fractional parts of the percolate at each stage of the operation.

The first column of the tables gives the number of the percolate and the amount. The second column the grains of dry extractive matter in each cc. after an exposure of twenty-four hours in a watch crystal, in a drying room, temperature 140°F. The third column gives the number of grains contained in each fluidounce of the percolate. It was obtained by multiplying the amount in each cc. by 29·52. The fourth column expresses the number of ounces the entire percolate represented, calculating seventy grains extractive matter in each

fluidounce, while the fifth column gives the actual expense of each ounce of percolate, estimating alcohol to be worth $2.24 per gallon, and the 7,680 grains cimicifuga 20 cents.

The comparisons in these two tables are based upon the supposition that equal proportions of all principles continue to be abstracted until the powder is depleted.

This consideration is necessary here, but my previous statement will be remembered, that my experiments do not permit me to believe each portion of a percolate contains the same component principles, a point yet to be considered.

TABLE 9. *Simple Percolation*, 7,680 *grains Cimicifuga.*

Percolate.	Grains extract'e matter in each cc.	Amount of dry extract contained in each fluidounce.	Calculating 70 grains to each fluidounce, the total percolate will make fluid extract.	Cost of fluid extract at each of the 24 stages, calculating 70 grs. dry extract to each ounce.	Percolate.	Grains extract'e matter in each cc.	Amount of dry extract contained in each fluidounce.	Calculating 70 grains to each fluidounce, the total percolate will make fluid extract.	Cost of fluid extract at each of the 24 stages, calculating 70 grs. dry extract to each ounce.
Fluid ounces.	Grains.	Grains.	Ounces.	Cents.	Fluid ounces.	Grains.	Grains.	Ounces.	Cents.
1	3.33	98.30	1.40	45.54	13	.77	22.73	9.00	9.53
2	2.80	82.66	2.58	25.39	14	.68	20.07	9.30	9.30
3	2.38	70.26	3.59	18.73	15	.58	17.12	9.53	9.25
4	2.19	64.65	4.71	14.65	16	.35	10.33	9.68	9.29
5	1.94	57.27	5.33	13.27	17	.36	10.62	9.83	9.33
6	1.71	50.48	6.05	11.98	18	.32	9.45	9.96	9.38
7	1.43	42.21	6.66	11.15	19	.23	6.78	10.06	9.46
8	1.34	39.56	7.22	10.53	20	.22	6.49	10.16	9.54
9	1.12	33.36	7.68	10.11	21	.22	6.49	10.25	9.63
10	.84	24.80	8.03	9.90	22	.21	6.20	10.34	9.72
11	.79	23.33	8.37	9.70	23	.22	6.49	10.43	9.80
12	.73	21.54	8.68	9.56	24	.21	6.20	10.52	9.88

Simple Percolation without Maceration.—In a percolator two and forty-five-hundredths inches in diameter, prepared like those mentioned on page 4, January No., 7,680 grains of powdered cimicifuga, previously moistened with four fluidounces of alcohol, were introduced, and pressed until it occupied fifteen inches in height. After covering the powder with a circular piece of paper, alcohol was supplied, continuously, until twenty-four fluidounces of percolate were obtained. The percolate, as it passed, was separated into portions of one fluidounce each.

Cost.—If the percolation had been arrested when the first fluidounce passed, it would have represented one and four-tenths troyounces of cimicifuga. To obtain this we used 7,680 grains of cimicifuga, the alcohol absorbed (twenty-four fluidounces), and the alcohol in the percolate. Calculating the sixteen troyounces of powdered cimicifuga at twenty cents, and alcohol at $2.24 per gollon, we have $45\frac{54}{100}$ cents as the actual cost of one standard fluidounce of fluid extract, providing the operation were now suspended. Each following fluidounce decreased in price until the fifteenth was reached, which cost $9\frac{25}{100}$ cents, after which there is a steady increase in cost. The twenty-fourth, costing $9\frac{88}{100}$, is almost exactly that of the tenth. This increase is due to the fact that the alcohol in the percolate, after the fifteenth ounce, is worth more than the extractive contained. Consequently, from a pecuniary view the point to suspend the operation in this case was the fifteenth ounce. Had this been done without any evaporation, each fluidounce would have cost $9\frac{25}{100}$ cents, while each fluidounce of the finished extract, U. S. P., after reserving fourteen fluidounces and evaporating the ten following to two, and adding to reserve percolate, cost $9\frac{88}{100}$ cents.

If the operation had been suspended at the fourteenth ounce, each ounce would have cost $9\frac{3}{10}$ cents and contained forty-six and five-tenths grains extractive matter, and, without evaporation, would have represented more cimicifuga to each ounce, at a less price, than the sixteen ounces of extract prepared from twenty-four ounces of percolate by the aid of heat.

Rate of Exhaustion.—The first fluidounce of percolate contains ninety-eight and three-tenths grains of extract, representing one and four-tenths ounces of the cimicifuga. The second fluidounce contained eighty-two and sixty-six hundredths grains; less in amount than the preceding, but still more than was necessary to represent four hundred and eighty grains of cimicifuga. The two ounces of the percolate represent two and fifty-eight hundredths ounces of cimicifuga. Following the column downward, we find the amount of extractive matter constantly decreases, until the sum of the extractive at the sixth fluidounce of percolate represents six and five hundredths grains of cimicifuga, almost exactly troyounce to fluidounce. Consequently, had the operation been suspended at this point, we would have obtained, without the use of heat, six ounces of fluid extract, repre-

senting the powder operated upon. At the fifteenth ounce, the cheapest point in the entire process, we represent nine and fifty-three hundredths troyounces of powder. The sixteenth ounce adds but ten and thirty-three hundredths grains extract, bringing the amount to nine and sixty-eight hundredths ounces.

The decrease in extractive matter continues till the twenty-first ounce is reached. This contains the same as the twentieth and twenty-third, viz.: six and forty-nine hundredths grains. The twenty-second is identical in amount with the twenty-fourth.

The last ten fluidounces of the percolate only add eighty-six and seventeen hundredths grains extractive matter, which is less than was contained in either the first or the second ounce of percolate. It only adds one and twenty-two hundredths troyounce of cimicifuga, to obtain which we expend eight fluidounces of alcohol. In reality it adds two fluidounces to the fourteen ounces of the reserved tincture, but this increase of bulk is deceptive, inasmuch as it dilutes the reserve. The fourteen fluidounces of reserved tincture contain 651·22 grains of dry extractive matter, an average of forty-six and fifty-one hundredths grains to each fluidounce.

The two ounces of evaporated tincture contain, in each, but forty-three and nine hundredths grains. Consequently, if the operation had been suspended at the fourteenth fluidounce of percolate, each ounce, without the use of heat, would have represented more cimicifuga than did each fluidounce of the finished extract. The expense would have been less.

Amount of cimicifuga used (see table 10), twenty-four troyounces. Height of powder, fifteen inches. Diameter of percolator, three inches.

Moistened with six fluidounces of alcohol. Inserted into percolator and prepared for percolation like the preceding. When the percolate appeared one fluidounce was obtained. The operation was suspended and maceration continued sixteen hours at temperature 100°F., when seven ounces were run off.

Maceration, in like manner, was again continued until the same time upon the following day. Eight fluidounces were then procured. In like manner, interrupted percolation was employed until the eighty fluidounces of the percolate had been obtained. The time allowed was thirty minutes to each fluidounce. Eight percolates were obtained

each day. After the thirty-second, each percolate contained two fluidounces.

TABLE 10. *Simple Percolation*, 11,520 *grains Cimicifuga.*

Percolate.	Grains extractive matter in each cc.	Amount of dry extract contained in each fluidounce.	Calculating 70 grains to each fluidounce, the total percolate will make fluid extract.	Cost of one ounce fluid extract at each of the 56 stages, calculating 70 grains dry extract to each ounce.	Percolate.	Grains extractive matter in each cc.	Amount of dry extract contained in each fluidounce.	Calculating 70 grains to each fluidounce, the total percolate will make fluid extract.	Cost of one ounce fluid extract at each of the 56 stages, calculating 70 grains dry extract to each ounce.
1 fluidounce.	Grains	Grains.	Ounces.	Cents	1 fluidounce.	Grains	Grains.	Ounces.	Cents.
1st floz.	2·85	84·13	1·20	78 3	30th floz.	·56	16·53	23·04	6·31
2.	3·10	91·51	2·51	38 4	31.	·54	15·94	23·27	6 32
3.	2·94	86·79	3·75	28·9	32.	·51	15·05	23 48	6·34
4.	2·63	77·64	4·86	20·5					
5.	2·57	75·87	5 94	17·1	2 floz.				
6.	2·41	71·14	6·96	14 8	33.	·48	14·16	23·88	6·34
7.	2·28	67·31	7·92	13·3	34.	·38	11·21	24·20	6·44
8.	2·12	62·58	8·81	12·1	35.	·37	10·92	24·52	6·50
9.	2·66	78·52	9·93	10 9	36.	·33	9·74	24·80	6·57
10.	2·28	67·31	10·89	10·1	37.	·29	8 56	25 04	6·64
11.	1 96	57·86	11·72	9·58	38.	·27	7·97	25·27	6·72
12.	1·90	56·09	12·52	9·10	39.	·29	8·56	25·52	6·79
13.	1·89	55·79	13·32	8·68	40.	·28	8 26	25·75	6·87
14.	1·84	54·32	14·09	8·33	41.	·29	8·56	25·99	6·94
15.	1·89	55·79	14·89	8·00	42.	·28	8·26	26·23	7·01
16.	1·89	55·79	15·69	7·71	43.	·30	8·85	26·48	7·08
17.	2·37	69·96	16·69	7·35	44.	·25	7·38	26 69	7·15
18.	1·99	58·74	17·53	7·10	45.	·28	8·26	26·93	7·22
19.	1·63	48 12	18·22	6·93	46.	·26	7·67	27·15	7·29
20.	1·51	44·58	18·85	6·74	47.	·27	7·97	27·37	7·36
21.	1 47	43·39	19·47	6 66	48.	·29	8·51	27·62	7 42
22.	1·39	41 03	20·06	6·56	48.	·37	10·92	27·90	7·47
23.	1·19	35·13	20·56	6·48	50.	·29	8·56	28·18	7·52
24.	1·12	33·06	21·03	6 42	51.	·26	7 67	28·40	7·59
25.	1·19	35·13	21 53	6 38	52.	·26	7·67	28·62	7·64
26.	·89	21·91	21 91	6·32	53.	·27	7·97	28 84	7·71
27.	·80	22·25	22·25	6·30	54.	·28	8·26	29 09	7·76
28.	·70	22·54	22·54	6 299	55.	·29	8 56	29·32	7·82
29.	·62	18·30	22·80	6·30	56.	·26	7·67	29·54	7·88

Cost.—The first fluidounce represented one and two-tenths troyounces of cimicifuga. To obtain this we used twenty-four troyounces of cimicifuga, the absorbed alcohol (thirty-six fluidounces) and the

alcohol in the percolate, total equivalent to $78\frac{3}{10}$ cents. The second represents one and thirty-one hundredths ounce. Each following ounce decreased in price to the twenty-eighth, costing six and three-tenths cents, the most economical point.

After this there is a steady increase to the thirty-sixth, which is almost exactly that of the twenty-second. The increase in cost continues to the end of the operation, at which point we find each ounce costs $7\frac{88}{100}$ cents, about what would have been had we discontinued the process at the fifteenth ounce. Had we reserved the first twenty-one fluidounces, continued the operation to the thirty-seventh, and evaporated last percolate to three fluidounces, and added the same to reserved portion, we would have obtained an extract costing $6\frac{57}{100}$ cents per ounce.

Rate of Exhaustion.—The first fluidounce of percolate contained eighty-four and thirteen-hundredths grains, representing one and two-tenths ounce of cimicifuga. The second fluidounce contained ninety-one and fifty-one hundredths grains, which is seven and thirty-eight hundredths grains more than the first. Following, we find a general decline to the ninth ounce, which contains more than the eighth. Again, there is a decline in each successive percolate, and when we arrive at the fourteenth we find the total percolate contains extractive matter enough to represent fourteen and nine hundredths ounces of cimicifuga; consequently, had the operation been suspended at this point, we would have obtained, without the use of heat, fourteen fluidounces of fluid extract, each ounce representing four hundred and eighty grains of cimicifuga. The fifteenth and sixteenth fluidounces contained one and forty-seven hundredths grain more than the fourteenth. The seventeenth rose to sixty-nine and ninety-six hundredths grains, surpassing the fifteenth. Again, there is a decrease to the twenty-fifth ounce, which rises two and seven hundredths grains above the twenty-fourth. The twenty-eighth ounce is the most economical point at which to arrest the operation. Here we find twenty-two and fifty-four hundredths ounces of cimicifuga represented. From the twenty-fifth ounce to the thirty-ninth percolate, with a couple of unimportant exceptions, there is a general decline. After the thirty-ninth little regularity can be observed, the percolate not representing more than nine grains to the fluidounce, excepting the forty-ninth, and it does not fall to six grains. The forty-fourth percolate contains least

of all. If the first twenty-one ounces had been reserved, and the following fifteen evaporated to three and added to the reserve, we would have had a process similar to the officinal. The twenty-four fluidounces of fluid extract would have represented the powder employed upon the basis we calculate. The total matter contained in the eighty ounces of percolate represented twenty-nine and a half ounces of cimicifuga. As this amount is apparently five and a half ounces more than the powder operated upon, we find that by this process we have made a better percolation than we did in the experiment which gave us the base for our calculations, although in that case the proportion of alcohol to material was much greater. The increase of extractive matter after each maceration (one exception) will be noticed. The officinal amount of percolate contained 83·95 per cent. of the total matter extracted by fifty-six ounces.

This process may properly be called percolation with maceration.

Remarks.—It will be noticed that in neither table are we warranted from an economical stand in carrying the percolation to the extent directed by the U. S. P. It would have been better in both cases to have suspended the operation sooner, which amounts to the same as operating upon a larger amount of powder than sixteen troyounces to produce sixteen fluidounces of fluid extract.

In the process given under Table 10, twenty-four troyounces of material were employed against the sixteen ounces of Table 9. It will be seen that this increase in material was not followed by a corresponding increase of extractive matter in the first ounce of percolate.

I will refer the reader to Table 2, given in the January "Journal," where sixteen ounces of material in different percolators occupies different heights, thus increasing the contact between the alcohol and powder, followed by a general increase of extractive matter from those having the greatest amount of contact.

This I believe a law of nature, mathematically true. I will not consume time with the theory, unless exceptions are made to it.

Thus, while the twenty-four ounces of powdered cimicifuga (Table 10) occupied fifteen inches in height, it was exactly the same as that of the sixteen of Table 9. The alcohol used was identical in both processes.

Each drop of alcohol came in contact with exactly the same amount of material in its downward course, provided the packing of

the percolators was properly made. The temperature of this first ounce was the same; then why should we expect a drop of alcohol to possess greater solvent power in the one case than in the other. The principle is the same as where equal amounts of powder were made to occupy unequal heights, thus unequalizing the contact; for here unequal amounts of powder occupy identical heights, equalizing the contact. The smaller amount of powder is brought to a level with the larger.

One other point. Greater force is required to pack sixteen ounces of powder fifteen inches high into a percolator 2·45 inches in diameter than is required to pack twenty-four ounces the same height into a percolator three inches in diameter, the proportions being correctly calculated. In like manner, it required less pressure as the percolators increased in size to make the sixteen ounces of powder occupy the calculated heights given in the January "Journal." The friction between the sides of the percolator and the powder is greater as the percolators decrease, and this actually *seems* to increase the density of the powder in the small percolator, followed as it is by a delay of the menstruum in its passage through; so that actually we have greater maceration in the case of the smallest amount of powder.

This fact may have influenced the first ounce of percolate in Tables 9 and 10, as the small percolator required nearly an hour longer before the liquid appeared. This ounce contained ninety-eight and three-tenths grains of extractive matter against eighty-four and thirteen hundredths grains from the first ounce of percolate from the larger amount of powder.

I think there can be little doubt, not reasoning from this experiment, that height of powder governs the value of the extract, other conditions being the same. After the first ounce of percolate had been reserved, the conditious of the operation were changed. The small percolator was removed to a cold room where the temperature was near freezing, and the percolation continued to the end of the operation. The other was placed in a location where the thermometer registered, most of the time, 100°F., and interrupted percolation pursued as before explained.

Result.—The percolate from the former run steadily down as regards dissolved principles; that from the latter exhibited a remarkable line of pulsations, corresponding exactly with the periods of maceration.

The former fell behind corresponding experiment at ordinary temperature (see Table 2, January "Journal"). The latter surpassed anything which has been offered, and the indications are that this increase of value resulted from the mode of percolation, in conjunction with the temperature.

I have taken it for granted that the increase in the extractive matter by maceration and heat are an advantage to the finished extract. I have made my calculations on the supposition that the value of the extract varies with the proportion of extractive matter, a point I have experimented much on, though not yet presented.

From those interested in my article in the January number I have have received many suggestions, but I cannot touch now upon all the points, wishing to avoid wandering, and to confine my remarks to a few points that may be considered with regard to the experiments given in each article. It will not do to make generalizations unaccompanied with reasons for same, and to give tables and remarks for even a few of the important points that suggest themselves would require more space than could be placed at my disposal.

If I have made any unjust comparisons I will consider it a kindness to be informed of the fact. There are errors creeping into all lines of experiments, but they can generally be corrected.

To Prof. Hough, of this city, I express my gratitude for the tedious check weighing he made of a very important portion of the experiments offered in the January number. In answer to the question which ended the article in that number, I think it may be safely said, We can, perhaps, though we must increase the material worked, and decrease the percolate obtained, if we apply the principle economically.

Note by the Editor.—It is due to Mr. Lloyd to state that the paper intended as a continuation of his essay closing on page 15 of the present volume was, after a delay occasioned by fire, received by us while Dr. Squibb's paper on page 209 was in the printer's hand. At our request Mr. Lloyd withdrew that paper and consented to go again over the same ground.

COLD PROCESS FOR SYRUPS.

BY R. H. B. HUNSTOCK, PH. G.

Abstract of a paper read before the Alumni Asso. of the St. Louis College of Pharmacy.

To improve this class of preparations, and to bring them as near as possible to a state of perfection, an entire change in the mode of preparation is necessary. The reformatory process that I propose to bring to your notice this evening is by no means a new one; Mr. Orinski, in the "Druggists' Circular" for March, 1871, refers to it, and the "American Journal of Pharmacy" for September, 1875, contains rather a concise explanation of the workings of the process and directions for its application, written by myself. This process is mainly peculiar in this respect, that in the manufacture of syrups *heat is excluded.* This, of itself, is plainly shown to be of great importance, especially for making such syrups as are esteemed for their delicate flavor, or have as the important medicinal ingredient a volatile, active principle. To explain as concisely as possible the necessary steps in the process I will take *simple syrup.* Thirty-six troyounces of sugar are to be dissolved in twenty fluidounces of distilled water, and sufficient distilled water afterwards added to make the whole measure forty-four fluidounces; the solution having been accomplished, the result will be simple syrup of the officinal strength. To effect this solution I take a one-gallon percolator of the ordinary shape and introduce, lightly, into the lower orifice a small piece of sponge, next introduce the sugar (granulated), and upon this pour the water, the apparatus being adapted as is usual in the process of percolation. The percolator may be covered loosely to keep out flies and dust, and the operation will proceed without further attention, the syrup coming through drop by drop. If it should be necessary to use crushed sugar the percolator must be corked at the lower orifice, the sugar and water introduced and allowed to macerate until the former has dissolved down to *half its bulk*, when the cork may be removed and the liquid be allowed to drop. If, after the liquid has all passed, there remain a quantity of undissolved sugar in the percolator, enough may be poured back to dissolve it, afterwards adding sufficient water to bring the whole up to the measure of two pints and twelve fluidounces.

To be successful in your first attempt at using the process, you must exercise care in several particulars, viz.:

1. The percolator used should be cylindrical or semi-cylindrical, and cone-shaped as it nears the lower orifice.

2. The sugar must be coarse, else it forms into a compact mass, which the liquid cannot permeate.

3. The sponge must be introduced with care. If pressed too tightly in it will effectually stop the process; if too loosely, the liquid will pass too rapidly and will, in consequence, be weak and turbid (not properly filtered).

The simple syrup produced by this process will be clear and transparent, of an unvarying consistency, and will not crystallize, simply because the water, when saturated, is of the same temperature as the surrounding air; and in like manner you may prepare the other officinal syrups. Obtain a menstruum by following the directions laid down in the Pharmacopœia, and lastly, instead of "dissolving the sugar by means of a gentle heat," introduce it into a suitable percolator and pour the liquid upon it, merely observing the directions for preparing simple syrup.

Of all the officinal syrups, the *compound syrup of squill*, on account of its liability to fermentation, is probably the most troublesome. Let the seneka and squill be exhausted and a menstruum prepared after the manner laid down in the Pharmacopœia; in this carefully prepared liquid let the sugar be dissolved by percolation; afterwards dissolve the tartrate of antimony and potassium in a small quantity of boiling distilled water, and add to the syrup. The result is a clear, thick, light-brown syrup, which I have never known to spoil. In the course of a few months there will occur a flocculent deposit which may be removed by straining.

To improve the appearance of *syrup of rhubarb* I add to the fluid extract twenty grains of carbonate of potassium, dissolved in a small quantity of distilled water, and afterwards sufficient simple syrup to make up the measure of one pint. The potassa dissolves the resinous matter in the fluid extract of rhubarb, and the result is a clear and highly-colored syrup.

The officinal process for *syrup of orange-peel*, I consider, gives us quite an inferior preparation. Heat is applied (and not always carefully) to evaporate the tincture and finally to dissolve the sugar, and the result generally is to destroy the delicate flavor which we prize, and which makes it so popular as an excipient. I find the following process gives

a very excellent result. In the first place, make a concentrated tincture of orange from the fresh peel, recently dried and ground, of the strength of eight troyounces to the pint, using a menstruum of three parts alcohol and one part water, then

Take of	Concentrated tincture of orange, .	f℥iv.
	Carbonate of magnesium, . .	ʒvi.
	Sugar (granulated), . . .	℥xxviii.
	Water, q. s.	

Triturate the tincture with the magnesium and one and a half troyounce of sugar in a mortar, gradually adding eight fluidounces of water during the trituration. Pour this upon a filter and add from time to time sufficient water through the filter to make the filtrate measure sixteen fluidounces. Pour the filtrate upon the sugar contained in a percolator, and proceed as in the case of simple syrup.

Syrup of iodide of iron, made as follows, gives a good result:

Take of	Iodine, ...	℥ii.
	Iron wire (cut), . . .	gr.ccc
	Distilled water, q. s.	
	Sugar, ...	℥xiiiss.

Mix the iodine, iron and three fluidounces of distilled water in a suitable glass vessel, and set aside until the reaction ceases and the combination is complete; filter the solution and add six fluidounces distilled water to the filtrate. Pour this upon the sugar contained in a covered percolator, and which has been adapted to an air-tight receiver; allow to drop slowly, and when the liquid has passed and the sugar is all dissolved add sufficient distilled water to make the whole measure twenty fluidounces. This gives a syrup alike in character and strength to the officinal and requiring only the same precautions for its preservation.

SYRUPS vs. COLD PERCOLATION.

By Wm. C. Bolm, Ph.G.

Abstract of a paper read before the Alumni Asso. of the St. Louis College of Pharmay.

I propose to show that the cold process for making syrups is not what we want, that it has been weighed and found wanting.

It is claimed that in making simple syrup by this process it will be clear, transparent and of an unvarying consistency, because it is of the same temperature as the surrounding air. I admit that it will be clear

and transparent, provided you have no mishap, but it is impossible to obtain as thick a syrup as you can when heat is used. To speak strictly about the scientific properties of a syrup made by the cold process and one made by heat, I must assert that the one made by heat is by far the best. It is a well-known fact that sugar prepared from the sugar cane contains more or less nitrogenous matter, and to some extent impurities of an organic basis. How is this impure matter removed? In making a syrup by heat you will always notice a large amount of scum, and by removing this scum you are removing all impurities which the sugar may contain. But it may be asserted that all this impure matter remains in the sponge which is used in the cold process. I beg leave to differ with the assertion, for I have prepared simple syrup in both ways, and I always found that I obtained more impure matter out of a syrup made by heat than out of the one by cold process. It is also claimed that heat is irregular and uncertain. This argument will not hold, for the officinal directions say plainly that the temperature shall be boiling point, and in order to obtain this you need no thermometer, for the naked eye will tell you that fact. One word more in reference to preparing simple syrup. By using heat you can make a syrup in a half an hour, and with the cold process it will take from three to four hours, which, under all circumstances, is a waste of time that speaks decidedly in favor of the officinal process. The other officinal syrups are prepared in like manner by the cold process. It is necessary to obtain a menstruum as laid down in the Pharmacopœia, and this is poured upon the sugar as directed with the simple syrup.

I will now consider the officinal *syrup of orange-peel*, which is an inferior preparation. And why? Because if heat is used, and it should be used carelessly, then the result will be that the heat will destroy the delicate flavor for which this syrup is noted. On this point the advocates of the cold process and myself agree; but we differ in regard to the change of formula which is necessary. They want a concentrated tincture of 8 troyounces of orange-peel to a pint in the strength of 3 parts of alcohol to 1 part of water. This tincture is to be triturated with magnesium carbonate and some sugar, gradually adding water, then filter with sufficient water to make it measure 16 fluidounces. This filtrate shall be used upon the sugar as directed by the cold process. My process,

on the other hand, is as follows: Take of orange-peel ℥xvi, macerate for 3 or 4 days with one pint diluted alcohol, then place in a percolator and add sufficient dilute alcohol to obtain two pints of tincture. Take 2 ounces of this concentrated tincture to 14 fluidounces of simple syrup made by heat, and you have a syrup which is of officinal strength. This syrup has lost none of its fragrant volatile principle, and stands without a peer. It is claimed that, according to this formula, this syrup will become turbid. I must say that I have had this syrup for a period of three months already, and I never noticed any turbidity. It is also claimed that the magnesia used in the other formula dissolves the resinous matter and makes a clear syrup. To this I will say that by dissolving this resinous matter you are changing the character of the syrup, for this resinous matter is the bitter tonic principle for which the syrup is occasionally prescribed. On the other hand, by using magnesia you cannot have all the volatile principle in the syrup, for it is a known fact that all volatile principles are taken up to some extent by the magnesium carbonate.

In order to improve the appearance of the *syrup of rhubarb*, it has been suggested to add 20 grains of carbonate of potassium to the fluid extract before adding the simple syrup made by the cold process. It is claimed that the potassa will dissolve the resinous matter of the extract, and the syrup will be a clear and highly-colored syrup. By doing this, you must call this syrup a *compound* syrup of rhubarb, because the addition of this alkali will change the character of the syrup and neutralize the chrysophanic acid of the rhubarb, which is not desirable in every instance where rhubarb is prescribed; for the physician may not want an alkali, and certainly everyone must admit that the druggist has no means of knowing whether he can add an alkali or not without directions by the physician.

There are other minor points which speak against the cold process, but even the officinal process in some syrups is inferior, and therefore we ought to have some changes in the officinal syrups, be it either by heat, cold percolation or any other mode of procedure, with the exception that if the cold process is adopted as officinal, it must be radically changed from its present mode, as advocated by its friends and supporters.

OFFICIAL OR OFFICINAL?

By F. Marion Murray, M.D.

"There is a defect in the first make of some men's minds, which can scarce ever be corrected afterwards, either by learning or age."—Burnet.

We are loth to suddenly part company with old friends, be they human, trophies, theories or words that may have become endeared to us by association or usage, yet this tie should never be so strong as to lead to the prejudicial side. Whatever is correct should be adopted and used, even though its discovery was not given to the fathers, but left to the sons. The adoption of *official* will be doing a justice to our language by giving to the word its rightful place, so long falsely occupied by officinal.

The term *officinal* is in favor with many because of its long usage; no thought being taken of its correctness or incorrectness.

No doubt the botanical use of officinal as a specific name for plants used in medicine, as, Althæa *officinalis*, Zingiber *officinale*, etc., has been one of the chief means of giving the word its prominence with the medical and pharmacal fraternities, but in giving specific names to plants already much used, and to be had in the apothecaries' shops, botanists meant merely that the particular Althæa or Zingiber should thereafter be known, for distinction only, as the species "of the shops," or officinal, the word having no reference to authority. Now, medicines that are recommended to be used by such bodies as the National Pharmacopœial Convention, British Council, etc., are *official*—given under authority—in the countries over which they have jurisdiction.

It is true that both words are derived from the same root, but officinal is the older, coming to us directly from the Latin *officina*, a shop; while official, the younger, comes to us through the French *officiel*.

"An *official* formula is one given under authority. An *officinal* formula is one made in obedience to the customary usage of the shop (*officina*). To state that any preparation under the sanction of the Pharmacopœia is officinal, is a misapprehension of the meaning of the word."—Brough.

"The Pharmacopœia and all in it are official (*office*, Fr. from L. *officium*, an office). There are many things which, in pharmacy, are officinal (Fr. from L. *officina*, a shop) but not official. To restrict the

word *officinal* to the contents of a pharmacist's shop, and to that portion of the contents which is pharmacopœial, is radically wrong, and should be avoided."—Note to "Attfield's Chemistry," 5th Ed., p. 25.

It has been objected that the "innovation," as it is called,[1] has nowhere received support. In refutatian of this I note that it has already been adopted by Prof. Attfield, in his "Chemistry;" Mr. Squire, in his "Companion to the British Pharmacopœia;" Mr. Wills —the most successful teacher of preliminary pharmacy in England—in the Westminster College of Chemistry and Pharmacy, and in our own country by the U. S. Marine Hospital Service. This ought surely to be authority sufficient to warrant the luke-warm in deciding in its favor, since the outlook is so bright.

Official has another advantage; it is one syllable shorter than the old word.

The objection that the word is new cannot obtain, because it long has been, and is in daily use in governmental circles. It is only taking a new direction.

The customary use of the term *unofficinal* is radically wrong,—its true meaning being that anything that is unofficinal is not to be had in the shops; while many articles that have never been accredited a place in any Pharmacopœia, and others that have been expunged, are constantly kept on sale in the shops. This ambiguity will cease to exist with the adoption of the term *unofficial*, which has but one meaning in medicine: not recognized by a national authority.

In view of all this, I beg authors that are about to issue books that may be used as authority, and the Pharmacopœial Convention of the Sixth Revision, to note the term and adopt it, thereby accepting the inevitable.

I hope we may not be given an opportunity to say, with Job, "They have refused to receive correction."

Philadelphia, Eighth mo. 20th, 1878.

Remarks by the Editor.—It will be noticed that the arguments advanced by Dr. Murray in favor of the change present nothing new,

[1] See article by Dr. A. W. Miller, on "Official and Officinal," "Amer. Jour. Phar.," April, 1875.

except that, *since* the publication of Dr. Miller's paper, in 1875, it had been adopted by several writers, which certainly cannot be called a refutation of his statement then made. We acknowledge the desirability of having a single term expressive of the fact that a medicine is recognized by the Pharmacopœia; but we doubt the propriety and correctness of the term "official," even at the risk of being classed with those "in the first make of whose minds there is a defect." Medicines which are regularly furnished according to the official supply table of the army and navy, may, perhaps, be called *official* medicines, even though not recognized by the Pharmacopœia; are they *unofficial*, if not mentioned in the supply table, but recognized (or not) by the Pharmacopœia, and furnished upon special *official* requisition?

In every language there are certain terms which, on close analysis, are more or less ambiguous, but which are sanctioned by usage. What the chemist designates as *water* is not what is popularly known or recognized as such by our Pharmacopœia. The *albumen* of the botanist and of the chemist are two entirely different substances, and an aqueous solution of the one is likewise known by the same name. The terms *neutral* and, as occasionally still employed, *saturated*, are of a similar character, and examples might be considerably multiplied. In our opinion it is better to adhere to a well understood, though ambiguous term, instead of changing it for another, as we believe, equally ambiguous one, about the greater correctness of which grave doubts are still entertained.

GLEANINGS FROM THE GERMAN JOURNALS.

By Louis von Cotzhausen, Ph.G.

Purification of Chloroform and the Presence of Amylic Alcohol in it.—Hermann Werner purifies commercial chloroform (made from alcohol) by mixing it with quarter its bulk of distilled water, shaking occasionally, withdrawing the water on the following day, and removing the HCl or water which may be present by macerating for 24 hours with sodium carbonate, previously heated to redness. After separating from the soda, the chloroform to be used for anæsthetic purposes is distilled on a water-bath at a temperature not exceeding 64°C.; the portion distilling at a higher heat is only used externally. The first portion of the distillate has the lowest specific gravity and is

turbid, but immediately becomes clear when shaken with a small quantity of sodium carbonate, previously heated to redness.

While purifying 5 kilos of chloroform, Werner continued the distillation until 90 grams remained in the retort, which gradually separated yellow, small drops, possessing the characteristic odor of fusel oil. On carefully distilling this residue the boiling point remained constant at 62°C. until only 4 or 5 grams were left, when it quickly rose to 66°C. The residue, on being now treated with sulphuric acid and potassium bichromate, yielded valerianic acid.—*Archiv d. Pharm.*, June, 1878, p. 481.

Adulteration of Etherial Oils.—Leonhardi considers the usual test for adulteration with alcohol, which consists of mixing the suspected oil in a graduated-tube with water, and then observing the increase or decrease in bulk of the latter, reliable, but objectionable and unadvisable for expensive oils on account of the unavoidable waste of the latter. He prefers the anilin test, which is applied by dropping a little of the suspected oil on a crystal of anilin-red, when the presence of alcohol is immediately indicated by a red coloration. The following adulterations were noticed by Leonhardi, who found the tests mentioned in connection with them reliable:

Fennel oil stearopten is imported from Russia for adulterating *oil of anise*, often to the extent of 90 per cent., because it likewise solidifies at a low temperature; it develops, however, a very characteristic odor of fennel, when heated, which easily betrays the adulteration.

Oil of coriander is extensively adulterated with colorless rectified oil of orange, which can be detected by its insolubility in 90 per cent. alcohol, in which pure coriander oil dissolves in every proportion; equal parts of oil of orange and 90 per cent. alcohol makes a turbid mixture.

Oil of bergamot is adulterated with oil of orange; the insolubility of oil of orange and the solubility of oil of bergamot in 90 per cent. alcohol also furnish a method of detection in this case.

Oil of caraway is often mixed with oil of caraway-chaff, which again is adulterated with oil of turpentine. Pure oil of caraway dissolves in 90 per cent. alcohol, while it forms a cloudy mixture if adulterated with turpentine. The behavior to iodine and the odor are often sufficient to prove the adulteration.

An American oil of peppermint, which has obtained about half a dozen of World's Exhibition prize-medals, and is sold in blue bottles holding 750 grams, was tested by the author. Iodine produced no red vapors and anilin-red no coloration; oil of turpentine and alcohol were therefore absent; 90 per cent. alcohol made a cloudy solution, while genuine English oil dissolves clear in every proportion. When mixed with equal parts of H_2SO_4, a dark-red coloration was produced, which remained on the addition of alcohol, while English oil causes a brown coloration. After comparing the American oil with different samples of European oils, the author came to the conclusion that the former was adulterated with rectified oil of sassafras.[1]—*Ibid.*, June, 1878, p. 490.

Oil of Thymus Serpyllum, *Lin.*, was by Dr. E. Buri subjected to fractional distillation and collected in 4 portions, boiling respectively at about 180°, 204°, 220° and 350°F. On agitating these fractions with water, acetic and another acid was taken up, the mixture of the two having an odor resembling that of butyric acid. None of the fractions yielded a crystalline compound with bisulphite of potassium. By agitation with potassa solution, and treating the latter with ether, both before and after acidulating it, two phenols were obtained, that from the alkaline liquid being about 3 per cent. of the weight of the oil, colorless; colored ferric chloride yellowish-green and yielded with sulphuric acid a sulphonic acid, the salts of which gave with ferric chloride an intense blue color, like that produced by thymol sulphonates.

The phenol of oleum serpylli resembles thymol, but differs from it in the following respects:

1. Its solution in diluted alcohol turns green with iron chloride, while thymol causes no noticeable coloration.

2. The phenol of oleum serpylli does not congeal at —10°C., while thymol often remains liquid at a moderate temperature, but solidifies at 0°C.

3. The potassium salt of the sulpho-acid is amorphous in the case of serpyllum, while that of thymol crystallizes easily.

Prof. Flückiger adds that thus far *thymol* has been obtained only from

[1] Owing to the high specific gravity of oil of sassafras, we doubt its being used for adulterating oil of peppermint. The latter, if of American origin, frequently contains the oil of Erigeron canadense, a weed, which always establishes itself in American peppermint plantations.—EDITOR AM. JOUR. PHAR.

the volatile oils of the following plants: 1, Thymus vulgaris, *Lin.*, by Caspar Neumann, in 1735, as "camphora thymi"; 2, Monarda didyma, *Lin.*, by Brunn, in 1796, as a crystalline deposit; 3, Monarda punctata, *Lin.*; its thymol was described by Arppe in 1846; 4, Doveri (1847) and Lallemand (1853) examined the crystalline part of oil of thyme, which was called thymol by the latter; 5, Ammi copticum, *Lin.* (Ptychotis ajowan, D. C., and Ptych. coptica, D. C.); the thymol was prepared by Stenhouse (1855) and Haines (1856), and its identity with thymol proven by Hugo Müller (1869).—*Archiv d. Phar.*, June, p. 485-489.

VARIETIES.

Polymnia uvedalia. By J. A. G. Clowes, M. D.—The success attending the treatment of malarial diseases, especially where the spleen is involved, sometimes exceeds the comprehension of some of the most learned in the medical profession. A case recently treated with the Bearsfoot, I thought would prove interesting to the readers of the "Reporter." Some three weeks ago I was consulted by Newton M., aged twenty-five, who complained of pain in the region and over the seat of the spleen, and upon examination I found tenderness, with marked enlargement of the organ. Upon questioning him, he gave a history of a series of attacks of intermittent fever about a year previous to consulting me. Thinking this would be a good case to test the merits of the Bearsfoot, I accordingly prepared an ointment after the following formula:

℞ Fl. ext. polymniæ uvedaliæ, ... ʒii
Adipis, ... ℥i M.

and directed that it should be applied twice daily. I also gave, as an internal medicine, a mixture of

Wine of pepsin, . . . ℥iii
Mur. acid, ... ʒss
Syr. simp., ... ℥i M.

Dose—Teaspoonful after meals.

One week later my patient returned, saying that his side was much better, and that the pain had changed. He, moreover, complained of headache, for which I gave small doses of morph. sulph., and advised the continued use of the uvedalia ung., as I was anxious to know something of the result of the vaunted cures by the uvedalia, and in less than a week he again returned, saying that the pain and soreness had entirely disappeared. It has now been over a week since he has felt anything of the pain. From the limited experience I have had with polymnia uvedalia in the form of an ointment for chronic rheumatism it has given very good satisfaction. It relieves the pain incident to that disease, and gives better use to the joints than any application in the form of an ointment that I have used.—*Med. and Surg. Rep.*, March 16.

Cantharidin and an Acid Derivative thereof. By J. Piccard.—Three determinations of the vapor-density of cantharidin gave the numbers 6·36, 6·60 and 6·41; the empirical formula of this body is therefore $C_{10}H_{12}O_4$. It enters into complete fusion at 218°C., and not at 250°, as usually stated.

By the action of hydriodic acid at a temperature of 100° in sealed tubes it is converted into a body, which, although possessing the same ultimate composition, differs essentially from catharidin. It crystallizes in needles, which melt at 278°, and are soluble in 12 parts boiling water; they are freely soluble in alcohol, slightly in ether, and insoluble in benzene. The solution of this body in glycerin does not blister the skin.

In its chemical properties it differs from cantharidin in being a strong acid, dissolving in and completely neutralizing alkaline solutions, decomposing carbonates with effervescence, and being but partially expelled from its salts by acetic acid. The salts of *cantharic acid*, as this body is termed by the author, contain 1 atom of metal to 10 atoms of carbon; the union of the acid with bases is attended with the elimination of H_2O; it is therefore a monobasic hydrate; its equivalent, as determined by titration (cryst. oxalic acid = 63) is 196.

The general formula of its alkaline salts is $C_{10}H_{11}O_3.OR'$. The lead salt crystallizes in long needles. Its formula is $(C_{10}H_{11}O_4)_2Pb$.—*Jour. Chem. Soc.* [Lond.], March, 1878, from *Deut. Chem. Ges. Ber.*, x, 1504—1506.

Certain Reactions of Chloral. By O. Wallach.—In extension of his investigation of the decomposition of chloral by potassium cyanide, the author finds that by the action of the more complicated cyanides upon this body, dichloracetic acid is likewise formed. In the case of potassium ferrocyanide, the formation of this acid is explained by the equation $2FeCy_6K_4+3[C_2Cl_3OH+H_2O]=3CCl_2HCO_2K+3KCl+2FeCy_3K+6CNH$. The resolution of chloralcyanhydrate into chloral and an alkaline cyanide, by the alkalis, results in the formation of dichloracetic acid, as a consequence of the mutual reaction of the immediate products of decomposition, thus:

$$CCl_3CH{}^{OH}_{CN}+KOH=CCl_2HCO_2H+KCl+CNH.$$

The above reactions are applied by the author to the production of dichloracetic ether, for which the necessary details are given. By heating chloralcyanhydrate with alcohol for some hours at 180°C., dichloracetic ether is formed; the decomposition of chloralcyanhydrate into dichloracetic acid takes place, therefore, independently of the alkalis.

The action of the cyanides upon butyl-chloral the author finds to be entirely analogous to that already described. Dichlorobutyric acid appears to be formed according to the equation $C_4Cl_3H_5O+CNK+H_2O=C_4Cl_2H_6O_2+KCl+CNH$, but owing to its instability passes at once into monochlorocrotonic acid. This reaction may be advantageously applied to the production of the latter acid.

That water plays a double part in decompositions of this nature, viz., of simultaneous oxidation and reduction by means of its elements, appears to be the only possible explanation of its action. The author is of opinion that the formation of

mono- in place of a dichloracetanilide, by the action of anilin acetate upon chloracetylcyanide, which was observed by Pinner, may be referred to a reduction by means of hydrogen which has been liberated from water formed in the course of the reaction.—*Jour. Chem. Soc.* [Lond.], April, 1878, from *Deut. Chem. Ges. Ber.*, x, 1525–1530.

A Process for Preparing Formic Acid. By V. Merz and J. Tibiriça.—Sodium formate can be prepared by passing a stream of carbon monoxide over soda-lime heated in an oil-bath to a temperature between 200° and 250°C. The absorption of carbon monoxide by soda-lime may be used as a lecture experiment to demonstrate the formation of organic compounds from inorganic materials, and it might be employed for manufacturing formic acid should a large demand for this acid ever arise.—*Ibid.*, from *Ibid.*, x, 2117.

Action of Alcoholic Potassa on Chloroform. By M. Berthelot.—By acting on a solution of chloroform in absolute alcohol, with alcoholic potassa, the author has obtained results which show that for the complete decomposition of 1 equivalent of chloroform, between 2 and 3 equivalents of potassa are sufficient, instead of 4 equivalents, as required by theory. From this and from the fact that a portion of the chlorine does not enter into combination with the potassium, he thinks it probable that a tribasic formic ether is produced, together with a chlorinated compound.—*Ibid.*, from *Bull. Soc. Chim.* [2], xxix, 4–6.

Juglone (Nucin). By C. Reischauer.—This body, prepared from the green shells of walnuts (*Juglans regia*), has been analyzed by the author, who assigns to it the empirical formula $C_{36}H_{12}O_{10}$.

A compound of this body with copper is obtained by adding its alcoholic solution to a solution of neutral cupric acetate either in water or alcohol. It occurs in small bronze-colored shining crystals, and after drying at 100° contains 15·83 per cent. Cu. Sufficient data are not yet at hand for the determination of the constitution of these compounds.

This paper also contains details of certain modifications of the ordinary method of combustion which had to be adopted in the analyzis of juglone, in consequence of its volatility.—*Ibid.*, March, 1878, from *Deut. Chem. Ges. Ber.*, x, 1542—1548.

Chemical Compounds contained in Liquid Storax. By Wilhelm v. Miller.—The results of the author's researches contained in the second part of the paper (too long for abstraction) show that, in addition to styrolene, cinnamic acid and styracin, storax contains—

(1.) *Phenylpropyl cinnamate* in considerable quantities.

(2.) *Ethyl cinnamate* in small quantities.

(3.) A body which smells like *vanillin*, and forms a crystalline compound with sodium bisulphite. This body melts at 65°, and may possibly be ethylvanillin. It occurs in small quantities.

(4.) A resinous body which accompanies the last in small quantities. Its composition has not been determined.

(5.) Two alcoholic bodies (α- and β-*storesin*) in very considerable quantities.

(6.) Compounds of these bodies with cinnamic acid also in considerable quantities.

(7.) A sodium compound of storesin in very small quantities.

Storesin (from Storax and resina) is the name proposed by the author for the body obtained from the residue left on extracting refined storax successively with caustic soda, cold alcohol, cold petroleum naphtha, hot petroleum naphtha (using an upright condenser). It melts between 160° and 168°C., and has the composition $C_{36}H_{58}O_3$.—*Ibid.*, February, 1878, from *Liebig's Annalen*, clxxxviii, 184—216.

Alkaloids contained in the Red Poppy. By O. Hesse.—The milk-sap of the unripe capsules of *Papaver Rhœas* leaves on evaporation about 34 per cent. of dry residue, which the author finds to contain no trace of morphia, or any similar alkaloid. The residue contains 2·1 per cent. of rhœadina, and traces of other, partially crystallizable alkaloids.—*Ibid.*, February, 1878, from *Liebig's Annalen*, clxxxv, 329.

Veratria. By E. Schmidt.—This alkaloid has been carefully examined by Merk (*Ann. Chem. Phys.*, xcv, 200), who ascribed to it the formula, $C_{32}H_{52}N_2O_8$, and by Weigelin (*Jahrb. f. Fortschr. Pharm.*, 1871, 28), who assigned to it the very different formula $C_{52}H_{86}N_2O_{15}$. It has been, therefore, re-examined by Schmidt, who obtained 56 grams from 5 kilos. of the seed of the *Veratrum sabadilla*, by exhausting them with very dilute sulphuric acid, and precipitating the crude base from the concentrated solution by ammonia. It was purified by dissolving it in ether, and repeated precipitation from its solution in hydrochloric acid by ammonia. Crude or commercial veratria appears to contain three modifications—namely, a crystalline base insoluble in water, an amorphous resinous base also insoluble in water, and an amorphous base which is soluble in water. Schmidt thinks this last is formed from the second during the process of separation. The commercial veratria is soluble in ether and alcohol, but nearly insoluble in water, and melts at 155°C. The crystalline modification appears to be the principal constituent, or to be veratria proper.

Veratria crystallizes from dilute alcohol in compact groups of short needles, which are readily soluble in alcohol and insoluble in water. They melt at 205°, or considerably higher than commercial veratria. From nine analyses, Schmidt deduces the formula $C_{32}H_{50}NO_9$, and he points out that this formula agrees with the analytical numbers obtained by Weigelin and Merk, with the exception of the single determination of the amount of nitrogen which the latter made. The *sulphate*, $(C_{32}H_{50}NO_9)_2.H_2SO_4$, forms an amorphous mass, readily soluble in water, and the *hydrochlorate*, $C_{32}H_{50}NO_9.HCl$, is a very similar body; neither of them is crystalline, as stated by Couerbe (*Ann. du Chem.*, 9, 112). The double *gold* salt, $C_{32}H_{50}NO_9.HCl + AuCl_3$, consists of a bulky yellow precipitate, soluble in hot

alcohol. The *platinochloride*, $2(C_{32}H_{50}NO_9.HCl).PtCl_4$, is a similar bulky amorphous yellow precipitate, easily soluble in alcohol, less soluble in water, and insoluble in ether. The *mercuric* compound, $C_{32}H_{50}NO_9.HCl + HgCl_2$, is a white crystalline precipitate, soluble with comparative facility in water, readily soluble in alcohol, but insoluble in ether.

The two other modifications of veratria appear from the results of the analysis to have the same formula as that of crystalline veratria, and their platinum salts are of similar character and constitution. All these, are, therefore, isomeric, but their difference in constitution has not yet been ascertained.—*Ibid.*, June, 1878, from *Arch. Pharm.* [3], x, 511—532.

Curarina. By T. Sachs.—According to the author's investigations, curare is soluble to the extent of 75 per cent. in cold water. The curarina contained in it is in combination with sulphuric acid, not with acetic acid, as stated by Roulin and Boussingault. The formula of curarina, as deduced from analysis of the picrate, is $C_{18}H_{35}N$. Curarina hydrochloride and sulphate are both very unstable, and not crystallizable. Solution of curarina acetate gives with *sodium chloroplatinate* a bulky yellowish-white precipitate of the formula $2(C_{18}H_{35}N,HCl) + PtCl_4$, which speedily decomposes, assuming a violet color. The acetate gives precipitates also with *potassium and mercury iodide, potassium and cadmium iodide, potassium cyanoplatinite, potassium chloroplatinite, gold chloride, tannin, picric acid, potassium and mercury chloride, sodium phosphate, sodium arsenate, potassium iodate, potassium thiocyanate*, and *potassium ferrocyanide* and *ferricyanide*.

Preyer's statements with regard to curarina (*Zeitschr. f. Chem.*, viii, 381) are, to a great extent, erroneous. A specimen of Preyer's "curarina sulphate," examined by the author, was found to consist mainly of calcium phosphate and carbonate.—*Ibid.*, June 1878, from *Liebig's Annalen*, cxci, 254—260.

The Action of Phosphoric Acid on Calcium Carbonate. By H. Ritthausen.—An aqueous solution of phosphoric acid acts on precipitated chalk, forming small needle-shaped crystals of di-calcium phosphate, $Ca_2H_2P_2O_8$; the tri-phosphate is never formed. The crystalline character of the phosphate renders it possible to detect very small quantities of this substance, even in presence of a large excess of calcium carbonate, by means of the microscope. The finely-divided chalk contained in marl deposited in the beds of streams or ponds is easily attacked by phosphoric acid. Dense particles of calcium carbonate in marl, which are scarcely acted on by phosphoric acid, are converted into di-calcium phosphate by the simultaneous action of carbonic and phosphoric acids.—*Ibid.*, March, 1878, from *Land. Versuchs-Stat.*, xx, 401-407.

The Behavior of Iodine to Amido-mercuric Chloride, in Presence of Alcohol; and a Safe Method of Preparing Iodide of Nitrogen. By R. Böttger.—Although iodine may be ground in a mortar along with amido-mercuric chloride, with no

other action than the formation of mercuric iodide, yet in presence of alcohol an explosion always takes place in 30 or 40 minutes, preceded by evolution of nitrogen, and sometimes separation of mercuric chloride. In presence of chloroform or amyl-alcohol, gas is evolved, but no explosion occurs.

The author's process for preparing nitrogen iodide consists in treating a solution of iodine chloride, obtained by heating iodine with nitro-hydrochloric acid with ammonia. Thus prepared, it never explodes when moist, and when dry only when touched with a piece of wood, or some similar substance.—*Ibid.*, from *Chem. Centr.*, 1877, p. 651.

Is the Decolorizing Power of Animal Charcoal due to the Carbon or to Porosity? By F. Jicinsky.—No direct answer is given to the question. The author states that during filtration (of sugar) the organic matters of the syrup, especially the coloring matters, and also the mineral salts, are absorbed by the surface attraction. The lime is withdrawn from the syrup chiefly as calcium hydrate, and partly also as carbonate. In the process of purification the reverse takes place to a certain extent as regards the salts. These are taken away again from the carbon by the water.

In the renovation of the charcoal, the calcium hydrate and carbonate are removed by the acid, and the sugar, together with absorbed organic matters, yields on fermentation first lactic and then butyric acid, thus reducing the complex organic matters to simple compounds. By the action of these acids a part of the lime is converted into the calcium salts of the fatty acids, and these again are converted on heating into calcium carbonate, and the porosity is restored. The fermentation is much more important than the heating.—*Ibid.*, April, 1878, from *Ibid.*, p. 138.

A New Ether of Glycerin. By Christian Göttig.—The salicylic ether of glycerin is prepared by dissolving salicylic acid in glycerin and passing hydrochloric acid gas through this solution heated to 100°C. The ether so obtained is purified, after washing, by distilling under reduced pressure, as it decomposes when distilled under the ordinary pressure. It is a colorless and odorless liquid, soluble in alcohol, ether and carbon disulphide. Analysis shows it to have the formula—

$$C_6H_4\begin{cases} OH \\ CO.OC_3H_5(OH)_2. \end{cases}$$

The author supposes that the hydrochloric acid acts so as to form first the monochlorhydrin of glycerin, and not salicyl chloride.—*Ibid.*, from *Deut. Chem. Ges. Ber.*, x, 1817–1819.

On Sodium Compounds of Salicylic Acid. By E. Hofmann.—If a solution of sodium salicylate containing free salicylic acid be kept for some time, large clear hard crystals separate. These become opaque on the addition of water, being converted into pseudomorphs of salicylic acid. They appear to be an acid sodium salicylate, $C_7H_5O_3Na + C_7H_6O_3$, which by water are resolved into sodium salicylate and free salicylic acid. They are, however, soluble without decomposi-

tion in alcohol, and may easily be prepared by evaporating an alcoholic solution of the acid and the sodium salt. The corresponding potassium, lithium, and amonium compounds have been prepared.—*Ibid.*, June, 1878, from *Arch. Pharm.* [3], xii, 226—229.

Behavior of Borax to Salicylic Acid and of Boric Acid to Salicylates. By E. Jahns.—It appears that the solution of salicylic acid in borax solution is no simple solution, but contains a compound, which can be crystallized from its solutions, and has the composition $C_{14}H_{10}O_5NaBO_2$. If 4 mols. of salicylic acid are dissolved in a boiling solution, containing 1 mol. of borax in about 5 parts of water, the solution on cooling first deposits boric acid unaltered, and then the compound

$$\left.\begin{array}{l} C_6H_4.COONaO \\ C_6H_4.COOHO \end{array}\right\} B(OH),$$

analogous to the borotartrate. The reaction therefore takes place according to the equation—

$$4(C_6H_4COOH.OH) + Na_2B_4O_7,H_2O = 2\left\{\begin{array}{l} C_6H_4.COONaO \\ C_6H_4.COOHO \end{array} B(OH\right\} + 2H_3BO_3 + 9H_2O.$$

Free borosalicylic acid has not as yet been obtained, but several of its salts are described, and the analogies between borosalicylic and borotartaric acids are pointed out.—*Ibid.*, June, 1878, from *Arch. Pharm.* [3], xii, 212—226.

PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

American Pharmaceutical Association.—Since our last issue the yellow fever, which had made its appearance at New Orleans, has extended its ravages up the Mississippi valley, and isolated cases have appeared in the Ohio valley, in several ports on the Atlantic coast, and a few inland cities, carried there by inhabitants of the infected localities and by vessels coming from ports where the fever had gained a foothold. Up to the time of writing this the Southern Atlantic ports and the Southern States generally, with the exception of the Mississippi Valley, have been free not only from epidemic yellow fever, but also from other diseases; and the location of Atlanta, and its general salubrity, is such that it may be visited at any time without fear of oppressive heat or climatic disease. Yet, after the circulars announcing the meeting for September 3d had been issued, the officers and Executive Committee were urged to such an extent in favor of postponing the meeting to a later date, that it was deemed prudent not to risk the threatened danger of failure from the causes which are explained in the following circular:

"*Pottsville, Pa., August 23d*, 1878.

"Guided by the advice and with the approval of the officers of the Association and of the pharmaceutists and druggists of Georgia, the Executive Committee

announce that the Twenty-sixth Annual Meeting has been POSTPONED until some time in November.

"From all the information in their possession the Executive Committee are still of the opinion that, at the time originally fixed for the meeting, Atlanta, Ga., would be as safe a place to visit as could well be selected. However, the spreading of yellow fever in the Mississippi Valley will keep many pharmaceutists at their posts, not only in the infected districts, but likewise in more distant localities; and an unnecessary alarm spread further North would very materially reduce the number of visitors from that section. On the other hand, it is of paramount importance that the meeting at Atlanta be well attended from Georgia and the neighboring States, as well as from those East and West.

"As soon as the necessary arrangements can be completed, the precise time at which the meeting will be held, will be announced by the President; and in due time the Secretary will issue notices, giving particulars. Members intending to attend the meeting will oblige the Secretary by notifying him.

"G. W. Kennedy, *Chairman Ex. Committee, Pottsville, Pa.*

"John M. Maisch, *Permanent Secretary*, 145 *North 10th St., Phila.*"

This is the second time in the history of the Association that such a course has been deemed necessary. The cause which led to the postponement, for a whole year, of the meeting which was to be held in 1861, will, we trust, never again make itself felt; the cause for this year's postponement *may* again occur; and we think it is mainly the fear of climatic diseases, prevailing at the time when the meetings of the Association have been held, which has deterred the members from meeting, ere now, as far south. There can be no question that the time has arrived when it would be good policy for the Association to extend its influence beyond the localities where it has been wont to meet; and the apparent difficulties which have hitherto operated against holding meetings at such places are by no means insurmountable. We are pleased to state that quite a number of members have already notified the Secretary of their intention of going to Atlanta.

New York College of Pharmacy.—The building purchased by this institution, as we announced in our March number (p. 140), has been completely renovated, and is ready for the accommodation of the class at the ensuing lecture term. It is located at 209 and 211 East Twenty-third street, and contains a handsome and large lecture room and a well-fitted laboratory, more roomy and convenient than the former one.

The Maine Pharmaceutical Association held its annual meeting July 21st, in the city of Portland. About noon the entire company marched from Reception Hall to Portland Pier and embarked on the steamer *Meta* for Harpswell, where they took dinner, and, after a number of toasts had been responded to, enjoyed themselves until late in the afternoon, when they returned to the city, where the meeting was held in the evening, Vice-President A. G. Schlotterbeck presiding, in the absence of President Partridge. New members were elected, the various officers and committees made their reports, and the following officers were elected to serve for the ensuing year: President, C. A. White, Gardiner; Vice-President, E. Dana, Jr., Portland; Secretary and Treasurer, Edward Merrill, Rockland; Auditor, S. Anderson, Jr., Bath.

Pittsburg College of Pharmacy.—We learn that the pharmacists and druggists of Pittsburg are considering the advisability of forming an association, with the view of establishing a course of lectures for the education of young pharmacists. A preliminary organization of the society has already been effected.

Philadelphia College of Pharmacy.—The London "Pharmaceutical Journal" of August 10th, in an article on the Paris Exhibition, says: "By far the finest collection of crude drugs in this department is that exhibited by the Philadelphia College of Pharmacy, which appears to include all the crude drugs used in the States, either by allopaths, homœopaths or eclectics, and is perhaps the most perfect of its kind in the exhibition."

Large and very valuable collections of foreign drugs for the museum of the college, have either arrived or are on the way to this country.

EDITORIAL DEPARTMENT.

Sapo Viridis.—Mr. H. Betz informs us that in the paper on green soap, published on page 66 of the February number, he omitted to state that the solution of potassa used by him contained 10 per cent. of the alkali; and that he considers such a solution strong enough to effect, with an equal measure of linseed oil, perfect saponification, the product being uniform and transparent.

Improved Education of Pharmacists.—The "Medical and Surgical Reporter" of July 6th contains an editorial under the above caption, which we produce below without comments, since all the shortcomings of pharmacists mentioned have been repeatedly discussed in this journal. There are, however, several "vexed subjects" upon which the editorial article does not touch, and which, in our opinion, are quite as important, if not more so, than the sale, by pharmacists, of so-called patent medicines, or of cathartic pills, oil of cloves, cold cream, and numerous other remedies well known to the public. While we frankly acknowledge that there is much room for improvement in the practice of pharmacy, we believe that the same is true also in the practice of medicine, since physicians often advocate the use of semi-proprietary and copyrighted medicines, of the composition of which they know no more than the manufacturer chooses to tell them.

"The Board of Trustees of the College of Pharmacy, of Philadelphia, have decided upon a junior and senior course of study. The junior students will have to pass an examination in all the branches before they can enter the senior class, and the instruction given to the senior class will include a wider range of scientific subjects than it has been possible to give heretofore. This system will go into effect in October. This is as it should be, and we have no doubt will prove a successful move.

"It is high time that the vocations of the pharmacist and the physician be recognized as two wholly and distinct careers. The doctor is yet, in many places, physician and apothecary in one, and the saddlebag system of dispensing medicine and advice has done the pioneer work in many a now thronged and prosperous locality. It was indispensable; it may be so yet, on the frontiers; but when not necessary, the custom should be discountenanced. Pharmacy is too complicated, too delicate, too difficult a science to be made any longer an appendage to a medical education, or to be taught in any other than a superficial manner in medical schools. Pharmaceutists should be men highly trained and specially given to their delicate and responsible work; for more delicate or careful work than the compounding of prescriptions can hardly be named; the apothecaries bear the people's lives in their hands, and the subject is one of real consequence to every person.

"The physicians of this country are called upon to encourage the separation of the two vocations, in their own interest. They cannot, indeed, do away with the 'counter prescribing' of the apothecary. Accidents and cases of sudden illness are brought to him, and while the physician may be at once summoned, it is still necessary, at least it is desirable, that the apothecary should be able to take the place of the doctor for the time, and do the needful professional offices.

"It has come to this, indeed, that the apothecary has indirectly a large amount of practice. People drop in upon him for all kinds of medical advice, and in thousands of cases apothecaries have a degree of trust reposed in them which is not proper, unless the party is a man of exceptional intelligence and education. Nor is this the case only in villages and sparsely populated neighborhoods; in such sections the practice thrives through the inability, at all times, of easily securing a physician; while in the cities it is almost equally common through accidents, and through the poverty of many persons who cannot consult a doctor, and yet are too proud to apply to the dispensaries. From one reason or another, it is known that apothecaries have a great deal of 'practice,' and it is a state of things not easily to be remedied. Nevertheless, we believe that an amicable understanding on this vexed subject is possible, and can be effected in any given locality by arrangement between the leading persons interested.

"Another frequent and just cause of complaint by the physicians is that druggists injure the community by selling harmful patent medicines. The pharmacists in England have themselves taken steps in this matter. At one of their recent conventions the importance was urged of fixing some legal limit to the wholesale poisoning of the public by patent medicines. It was proposed that, even if it be impossible altogether to suppress the reaction of dishonest quackery upon vulgar superstition, the venders of nostrums be compelled to divulge the composition of their wares, and prevented from publishing mischievous and mendacious advertisements concerning them. Among the examples cited, including sundry 'hair restorers,' which, in direct contradiction of their advertised pretensions, contain poisonous quantities of lead, the most glaring one is a largely certificated 'Sure Cure for the Opium Habit,' which is found, on analysis, to give two grains of morphia to the dose, recommended to be taken thrice a day.

"It is scarcely to be expected that American apothecaries, most of whom derive a large part of their income from the sale of these secret nostrums, will join in this movement at once, but it would be well if the American public were taught that ninety-nine hundredths of the proprietary medicines that flood the market are the products of uneducated imposters, and are either wholly inert or positively deleterious. Some steps in this direction have already been taken by the National Pharmaceutical Association. With further elevation in the education of pharmacists, most of them will acknowledge the utility of such a movement."

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

Annual Reports of the Supervising Surgeon-General of the Marine-Hospital Service of the United States for the fiscal years 1876 *and* 1877. John M. Woodworth, M.D. Washington: Government Printing Office. 1878. 8vo, pp. 213.

As in former years, the report of Surgeon-General Woodworth contains an account of the operations of the Marine-Hospital Service, and statistics relating to the finances and economic exhibit, as well as to the medical and surgical service performed. The appendix contains, as usual, a number of valuable papers. The most important for pharmacists is one by Professor Oscar Oldberg, entitled "Metric weights and measures for medical and pharmacal purposes," in which the advantages of the metric system are very clearly set forth, and which has led to its adoption by the Marine-Hospital Service, as we have informed our readers on a former occasion (page 364). We may state here that several medical journals in the United States have likewise adopted it and now print all formulas and doses in that system.

The other papers contained in this volume are the following: Physical examination of seamen, by Surg. P. H. Bailhache; River exposure and its effects upon the lungs, by Surg. Walter Wyman; Yellow fever in Savannah in 1876, by Assistant Surg. Geo. H. Stone; Yellow fever in Savannah and New Brunswick, Ga., in 1876, by Assistant Surg. H. Smith; Yellow fever at Fernandina in 1877, by Surg. Rob. D. Murray.

On the Therapeutic Forces: an effort to consider the action of medicines in the light of the modern doctrine of the conservation of force. By Thos. J. Mays, M.D., member of the Luzerne county Medical Society, etc. Philadelphia: Lindsay & Blakiston. 1878. Pp. 143. Price, $1.25.

The author states in the preface that he has firmly espoused the belief that the action of medicines in the animal body is, like everything else, amenable to unchanging laws, and that it is our duty to unravel and elucidate these laws. The view which the author favors is expressed in the title.

The introductory chapters treat of therapeutical forces in general, and discuss more particularly the subjects of tissue-waste, nitrogenous foods as tissue-builders and non-nitrogenous food as force-producers. The tissue-builders or constructive agents do not strictly fall within the scope of the essay, which is confined to those agents or forces tending to modify the molecular activity of the body. This activity may be accelerated both by chemical and mechanical forces; but rapidity of molecular motion and health are not synonymous, and there must naturally be a point where this activity can be pushed over the bounds of health into those of disease.

Chapter III treats of the *chemical stimulants*, namely, fats and oils, which are wrongly classed as hydrocarbons, carbohydrates, alcohol, phosphorus, oxygen.

The action of the *mechanical stimulants* is considered in the following two chapters. In this class are ranked quinia, quassia, berberis, columba, gentiana, nectandra, ammonia, iodine and iodides, cold, opium and those medicinal substances known as counter-irritants, such as croton oil, cantharides, mustard, etc. These are

followed by a brief chapter on *narcotics* and the concluding chapter, containing a brief recapitulation with deductions.

The little book is well written and the author's views are clearly expressed. In our opinion, even those who may not be prepared to accept the conclusions will acknowledge the value of this philosophical inquiry into the action of medicinal agents.

The Druggists' Hand-Book of Private Formulas. By John H. Nelson. Cleveland, O.: 1878. Pp. 206. Price, $3.00.

As indicated by the title, the book contains chiefly formulas, which are classified under pharmaceutical department, perfumery department, proprietary medicines, miscellaneous formulas and appendix. A few of the formulas are officinal in the United States or some other pharmacopœia, others are intended as substitutes for officinal ones, but the large majority, over 500, comprise formulas which are either scattered in many works and journals, or are of that kind which gradually accumulate in the private manual of the apothecary and druggist. Being intended for practical use, the book naturally contains formulas for numerous so-called elegant pharmaceuticals, among them over 90 for elixirs alone, which, however, differ from those adopted by the American Pharmaceutical Association. As far as we have examined them, we believe the formulas to be "practical."

Untersuchungen aus dem Pharmaceutischen Institute der Universität Dorpat. Mitgetheilt von Dragendorff. 8vo, pp. 64.

Investigations from the Pharmaceutical Institute of the University of Dorpat.

This pamphlet is a reprint from "Archiv der Pharmacie," 1878, and contains investigations of several Abyssinian remedies, namely, *add-add* (*Celastrus obscurus*), which contains tannin, volatile oil and bitter principle; *tshuking* or *Zerechtit* (*Ubyæa Schimperi*), consisting of flowers, which resemble those of yarrow, and contain 1·7 volatile oil, 2·8 tannin and a trace of bitter principle; *kosāla*, consisting of brown seeds recommended against tapeworm; it was found effectual when given to a large dog, but given to small dogs and cats it produced either vomiting or gastric disturbances; its origin is unknown.

The second part of the pamphlet contains "notes on forensic chemistry" (gelsemium, jaborandi, taxus, various volatile oils, etc.), and the third part some contributions relating to the valuation of *levant wormseed.*

The following pamphlets have been received:

Belladonna as a Stimulant to the Circulatory System. By R. H. Weber, M.D. Reprinted from the Philadelphia "Medical Times."

Medico-legal Evidence relating to the Detection of Human Blood presenting the alterations characteristic of Malarial Fever, on the Clothing of a Man Accused of Murder, etc. By Prof. Jos. Jones, M.D. Reprinted from the New Orleans "Medical and Surgical Journal," August, 1878.